

REMARKS

Claims 51-64 are pending in the present application. With entry of this Amendment, Applicants amend claim 51. Reexamination and reconsideration are respectfully requested.

Applicants have amended the title of the application as requested by the Examiner.

Applicants have amended claim 51 to recite a "resist film" as opposed to a "deposit." Applicants have also amended claim 51 to recite "molecules of the solvent vapor" as opposed to "gas molecules of the solvent." These amendments are made to place the claim in better form and are unrelated to the present rejection.

The Examiner rejected claims 51-60, 63 and 64 under 35 U.S.C. 103(a) as being unpatentable over Vaartstra (US 6242165 B1) in view of Smith, Jr. et al. (US 5863348). Claim 61 was rejected under § 103(a) as being unpatentable over Vaartstra and Smith, Jr. in view of McConnell et al. (US 4917123). The Examiner rejected claim 62 under § 103(a) as being unpatentable over Vaartstra, Smith, Jr., and McConnell in view of Shortes et al. (US 4341592).

The present invention, as set forth in claim 51, is directed to a substrate processing apparatus. The apparatus comprises a processing vessel and a main heater for heating the processing vessel. The apparatus further comprises a process gas supply section for supplying a process gas into the processing vessel and a solvent vapor supply section for supplying a solvent vapor into the processing vessel. The solvent vapor supply section includes a solvent heater.

Claim 51 recites "a control unit for controlling the solvent heater and the main heater to control a temperature of the substrate and a temperature of the solvent vapor such that a mixed gas molecular layer of a mixture of molecules of the solvent vapor and molecules of the process gas is formed on the substrate to alter the resist film into a water-soluble substance." A mixed gas molecular layer is more effective than a liquid film of solvent for removing a resist film (see, e.g., page 20, line 27 to page 22, line 27 of the specification).

Applicants respectfully submit that none of the references discloses the recited control unit.

Fig. 2 of Vaartstra discloses a mixing manifold 122 for heating components (see also Col. 9, lines 13-28). The heated components are delivered to pressure vessel 114. The temperature of pressure vessel 114 is monitored by thermocouple 128 which relays signals to the temperature control unit 130. The temperature control unit then sends the appropriate signals to heater inputs 132 (see also Col. 9, lines 38-47). Thus, Vaartstra merely discloses a control unit that controls a single heater, i.e., heater inputs 132. There is no disclosure of controlling a solvent heater and a main heater as recited in claim 51. As a result, Vaartstra also fails to disclose controlling a solvent heater and a main heater to control the temperature of the solvent vapor and substrate to form a mixed gas molecular layer for altering the resist film.

Fig. 7 of Smith, Jr. discloses computer 200 connected to temperature sensors 410-428 (see also Col. 7, lines 66 to Col. 8, line 14). However, Smith, Jr. fails to disclose that computer 200 controls a solvent heater and a main heater to control the temperature of the solvent vapor and substrate to the form a mixed gas molecular layer for altering the resist film. Indeed, Smith, Jr. discloses that the computer merely provides control for liquid immersion and spraying of semiconductor elements (see, e.g., Col. 3, lines 3-20 and Col. 8, lines 15-41).

Accordingly, Applicants respectfully submit that claim 51 is patentable over Vaartstra and Smith, Jr.

Applicants respectfully submit that dependent claims 52-60, 63 and 64 are patentable over Vaartstra and Smith, Jr. for at least the reasons set forth above. Applicants note that McConnell and Shortes do not disclose the recited control unit and, thus, claims 61 and 62 are patentable over the respectively cited references.

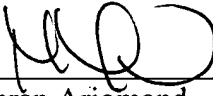
In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

If, for any reason, the Examiner finds the application other than in condition for allowance, Applicants request that the Examiner contact the undersigned attorney at the Los Angeles telephone number (213) 892-5630 to discuss any steps necessary to place the application in condition for allowance.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Docket No. 199372002501.

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Respectfully submitted,

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